Apparent consumption of nutrients Australia 1997–98

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List of abbreviations

ABS	Australian Bureau of Statistics
AGPS	Australian Government Publishing Service
AIHW	Australian Institute of Health and Welfare
ANZFA	Australia New Zealand Food Authority
FSANZ	Food Standards Australia New Zealand
g	grams
kJ	kilojoules
mg	milligrams
µg	micrograms
NHMRC	National Health and Medical Research Council
r	data revised since previously published
RDI	Recommended Dietary Intake

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Introduction

This report was produced by the National Centre for Monitoring Cardiovascular Disease at the Australian Institute of Health and Welfare (AIHW) in collaboration with Food Standards Australia New Zealand (FSANZ), formerly the Australia New Zealand Food Authority (ANZFA). The report estimates the nutrient content in the food supply, from which assessments can be made as to whether the nutrients available for consumption in Australia are adequate to meet the needs of the population.

This report continues part of a long series produced by the Australian Bureau of Statistics (ABS) to estimate the levels and trends in food and nutrient consumption. It uses the same sources and methods as the *Apparent Consumption of Foodstuffs* series (ABS Cat. No. 4306.0), along with food composition data supplied by FSANZ. Food supplies that are *available* for consumption are termed 'apparent' consumption because they are a crude and indirect measure of actual use by consumers. However, since available foodstuffs are by definition not stockpiled it is assumed that they reflect consumption reasonably well, because in most cases they will find their way to individual consumers with a minimum time lag. For further information on the sources and methods used, refer to the Explanatory notes (Methodology subsection.

In this report, detailed nutrient data are shown for the period 1993–94 to 1997–98 (up until 1993–94, nutrient estimates were published in conjunction with the ABS series *Apparent Consumption of Foodstuffs and Nutrients)*. Tables are included showing the estimated supply of nutrients, the availability of specific vitamins, the estimated nutrients available for consumption, the percentage of total energy derived from each commodity group, and the nutrients available for consumption compared with Recommended Dietary Intakes.

Interpretive comments on the apparent consumption of nutrients are included in the Results section. This section includes commentary on trends in the availability of nutrients in the food supply, identifies food groups contributing to specific changes and compares the apparent consumption of nutrients with Recommended Dietary Intakes.

Calculation of the nutrient data depends on several assumptions and approximations. In analysing time trends, the assumption is made that there is a consistent relationship over time between food availability and actual consumption. Another important factor is the imperfect correspondence between the available descriptions of commodity items and the available data on the nutrient composition of foods. Items in the food database are linked to items in the food composition database to produce the nutrient consumption data. A brief overview of the methodology used in this process and the consequent nature and limitations of the data produced are included in the Explanatory notes section.

Interpretation of the data

As noted in earlier publications of the *Apparent Consumption of Foodstuffs and Nutrients* series, these data relate only to the availability of nutrients in the Australian food supply and as such should not be used as a surrogate for actual nutrient intake.

Nutrient consumption data for 1993–94 were published by the ABS (ABS 1997). Some data for 1993–94 published in this report have been revised, due to amendments in the consumption data provided by the ABS, and as a consequence may not agree with earlier published results. Caution should be exercised when comparing data presented in this

report with those from earlier publications because of revised nutrient composition data provided to AIHW by FSANZ and modifications to the foodstuffs data provided to AIHW by the ABS.

Results

With few exceptions, the supply of nutrients available to Australians through food remained relatively constant between 1993–94 and 1997–98. Australia's food supply is characterised by an abundance of all macronutrients, as well as vitamins and the majority of trace elements examined.

Macronutrient supply

Macronutrients comprise carbohydrates, fats and proteins. Carbohydrate was the major macronutrient in the food supply, contributing around half the energy supply (Figure 1). Grain products and sugars were the major sources of carbohydrate in the food supply, with the proportion of carbohydrate contributed by the sugars group increasing slightly over the period examined compared with that contributed by grain products (Table 1). Sugars contributed around one-third of available carbohydrate.

Fat supply remained relatively constant at around 101–104 g per capita per day throughout the reporting period. Fat contributed approximately 32% of the energy supply, with the oils and fats group the major source of available fat.

Meat and meat products, grain products and dairy products were, in descending order, the three major sources of protein in each year examined.

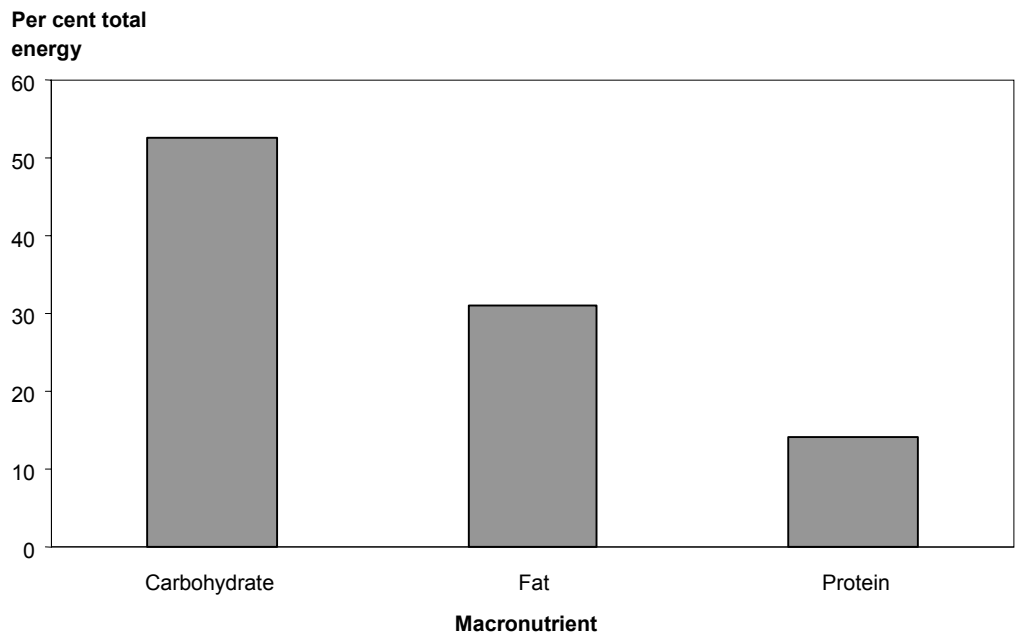

Figure 1: Apparent per capita consumption of carbohydrate, fat and protein as a percentage of total energy, 1997–98

Total energy supply

Total energy supply did not change greatly for most food groups over the period reported (Tables 1 and 4). However, a notable finding was the decline in the contribution of meat and meat products to total energy, from 8.1% in 1993–94 to 7.5% in 1997–98. The contribution of oils and fats also showed a consistent decline during the reporting period, from 16.1% in 1993–94 to 14.6% in 1997–98. The contribution of poultry to total energy remained steady at 3.2–3.3% throughout the period examined.

Grain products were the major source of the energy supply in the Australian diet, contributing 26.8% of total energy in 1997–98. Sugars and oils and fats exceeded dairy products and meats as energy sources for each year examined.

Recommended Dietary Intakes

Between 1993–94 and 1997–98, the available supply of nutrients substantially exceeded the Recommended Dietary Intakes (RDIs) (adjusted for the age and sex distribution of the Australian population) for all nutrients estimated, except calcium, sodium and potassium (Figure 2). Energy per capita supply exceeded the recommended energy intakes, and protein per capita supply exceeded the RDI, by around 30% and 119%, respectively for 1997–98 (Table 5).

The trace elements iron, magnesium, and zinc were all available in excess of the RDI. Calcium supply just exceeded its RDI for each year examined, peaking at 914 mg per day for 1996–97 (RDI for calcium is 840 mg).

This is the first time that data on the trace elements sodium and potassium have been reported. In all years examined, sodium supply remained below the RDI and potassium supply was at or just below the RDI. However, these data should be interpreted with caution. In general, sodium data reflect the amount of sodium naturally occurring in raw foods and do not take into account salt added to processed foods nor discretionary salt use in cooking. Also, sodium and potassium data do not take into account the supply of these nutrients in processed foods that contain sodium- and potassium-based food additives. Therefore, actual intakes by Australians were likely to be much higher than reported here.

All vitamins monitored in this study were in the food supply at levels well in excess of the age- and sex-adjusted RDI (Figure 2). Retinol equivalents and vitamin C were available at levels two to three times in excess of their RDIs in each year examined. Thiamin, riboflavin, niacin equivalents and total folate were each available in amounts approximately 0.5 to two times in excess of their respective RDIs.

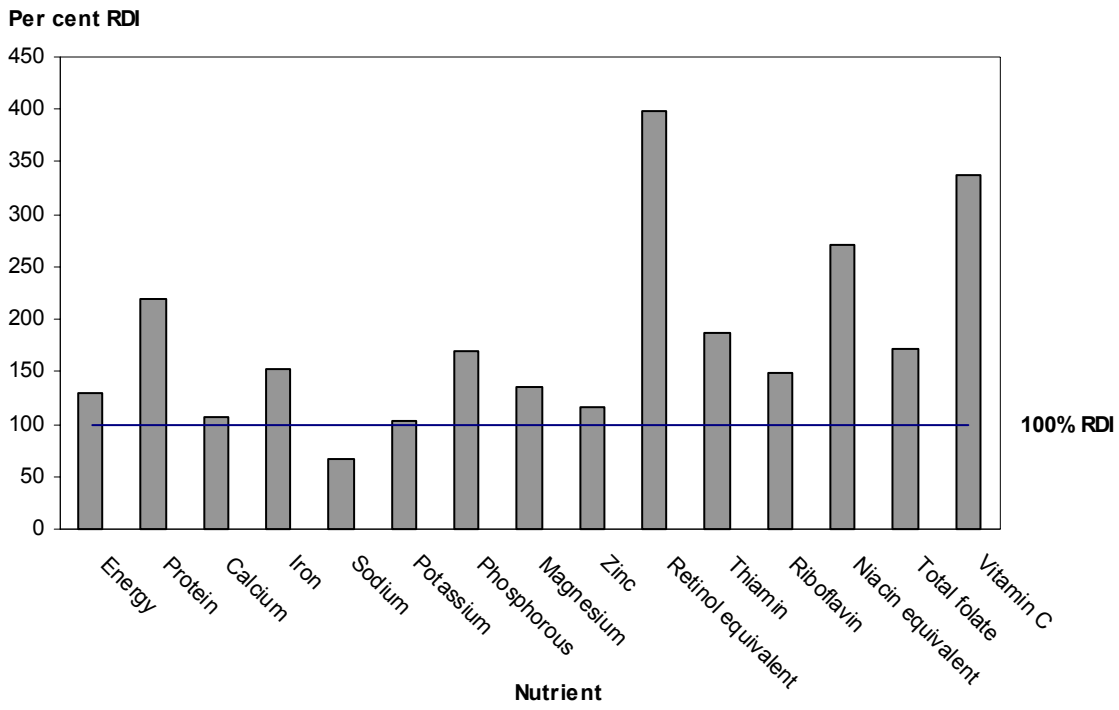

Figure 2: Apparent per capita consumption of selected nutrients as a percentage of RDI, 1997–98

Vitamin and mineral supply

The food groups contributing to the vitamin supply varied depending on the vitamin in question (Table 1).

Dairy products were the major source of riboflavin in the food supply, contributing almost half the supply of this vitamin. Grain products were the major source of niacin and thiamin.

Vegetables and vegetable products, and fruit and fruit products, were the two major sources of vitamin C. Vitamin C per capita supply (adjusted to take into account the effect of processing, except juicing, on the vitamin C content of the fruit commodity group and for processing and cooking on the vitamin C content of the vegetables commodity group) showed an upward trend over the period 1993–94 to 1997–98 (Table 2). Contributors to the increase in vitamin C during this reporting period were fresh tomatoes and citrus fruits. The adjusted amount of available vitamin C has more than doubled since the 1930s when the daily per capita amount available was 53 mg, compared with 115 mg in 1997–98.

This is the first time that data on the supply of total folate, magnesium and zinc have been reported. Hence, any trends in these data should be interpreted with caution. The amount of total folate available for consumption increased by approximately 15% between 1994–95 and 1997–98 due primarily to an increase in folate from grain products: from 275 µg in 1994–95 to 317 µg per capita per day in 1997–98 (Figure 3). Grain products contributed approximately 25% of total available folate in 1997–98, compared with only 18% in 1994–95, although vegetables and vegetable products were the major source of folate in 1997–98, contributing 36%.

The total magnesium supply increased steadily from 302 mg to 358 mg, and total zinc supply increased slightly from 12.0 mg to 12.8 mg per capita per day over the reporting period (Tables 1 and 3).

These upward trends in folate, magnesium and zinc predominantly reflect the introduction of revised nutrient composition data for flour and breakfast cereals from 1995. These revised data incorporate a contribution for wholemeal flour and also reflect folate fortification practices.

The amount of total sodium available in the food supply decreased from 1,095 mg in 1993–94 to 1,019 mg per capita per day in 1997–98, which represents a 7% decrease over the period (Tables 1 and 3). This apparent decrease may again be attributable to the revised nutrient composition data for grain products. As noted above, this figure does not take into account salt added to processed foods or discretionary salt use. Vegetables and vegetable products were the largest source of available potassium.

The data presented in this report are estimates of nutrients available for supply in Australia. They do not provide any information on the distribution of nutrients within Australia or about amounts of nutrients actually consumed by particular groups within the population.

Note: The ABS were not able to supply data on 'Grain products' available for consumption in 1993–94, hence data for 1994–95 are shown in the graph.

Figure 3: Apparent per capita consumption of folate, by selected food groups, 1994–95 and 1997–98

Table 1: Estimated supply of nutrients (unadjusted),[a] Australia, 1993–94 to 1997–98 (per capita per day)

Commodity group	Energy	Protein	Fat	Available carbohydrate	Calcium	Iron	Sodium	Potassium	Phosphorous	Magnesium	Zinc	Retinol equivalents[b]	Thiamin	Riboflavin	Niacin	Total folate	Vitamin C
		Macronutrients			Trace elements							Vitamins					
	kJ	g	g	g	mg	mg	mg	mg	mg	mg	mg	µg	mg	mg	mg	µg	mg
1993–94																	
Meat and meat products	r962	r27.3	[i]r13.5	r0.0	r10	r2.3	85	456	257	29	4.2	r1,555	r0.35	r0.25	r6.2	20	r1
Poultry	382	8.8	6.3	0.0	3	0.4	29	107	76	9	0.4	19	0.02	0.05	1.7	5	0
Seafood	r132	r5.5	r1.0	r0.1	r19	r0.4	69	85	80	10	1.4	r6	0.01	r0.04	r1.2	3	0
Dairy products[d]	r1,419	r20.1	r20.0	r21.0	r668	0.6	342	634	514	53	2.5	r244	r0.16	r0.92	r0.8	33	4
Fruit and fruit products	r544	2.3	0.3	r29.4	r45	r0.9	10	476	50	27	0.4	r54	0.14	0.08	0.8	33	64
Vegetables and vegetable products	r600	6.9	0.5	r26.8	r45	2.0	38	1,148	154	52	1.2	r518	r0.25	r0.16	r3.3	110	73
Grain products[e]	r3,068	r21.7	r2.7	r152.8	r42	r5.8	177	348	284	81	1.3	r1	r0.92	[h]r0.43	r6.6	50	0
Eggs	112	2.4	1.9	0.1	7	0.3	25	22	28	2	0.2	30	0.01	0.08	0.0	9	0
Nuts	r255	r1.8	r5.8	0.6	r8	0.3	0	57	40	17	0.3	0	r0.06	r0.03	0.7	7	0
Oils and fats	r1,917	r0.1	r51.7	0.2	3	0.0	260	7	4	0	0.0	r293	0.00	r0.01	r0.1	0	0
Sugars	r1,951	0.0	0.0	r121.4	r6	0.1	31	11	2	2	0.1	0	0.00	0.00	0.0	0	0
Beverages (alcoholic)[f]	r557	0.9	0.0	6.3	r14	0.1	29	116	43	20	0.0	0	0.00	0.00	1.2	10	6
Total[g]	**r11,898**	**r97.9**	**r103.7**	**r358.7**	**r871**	**r13.3**	**1,095**	**3,467**	**1,532**	**302**	**12.0**	**r2,720**	**r1.93**	**r2.04**	**r22.5**	**280**	**r147**

See footnotes at end of table.

(*continued*)

Table 1 (continued): Estimated supply of nutrients (unadjusted),[a] Australia, 1993–94 to 1997–98 (per capita per day)

		Macronutrients			Trace elements							Vitamins					
Commodity group	Energy	Protein	Fat	Available carbo-hydrate	Calc-ium	Iron	Sodium	Pot-assium	Phos-phorous	Mag-nesium	Zinc	Retinol equiva-lents[b]	Thiamin	Ribo-flavin	Niacin	Total folate	Vitamin C
	kJ	g	g	g	mg	mg	mg	mg	mg	mg	mg	µg	mg	mg	mg	µg	mg
1994–95																	
Meat and meat products	928	26.6	[i]12.9	0.0	10	2.2	82	444	250	28	4.1	1,498	0.35	0.24	6.0	20	1
Poultry	370	8.5	6.1	0.0	3	0.4	28	104	74	9	0.4	19	0.02	0.05	1.6	5	0
Seafood	135	5.6	1.0	0.1	20	0.5	72	88	83	10	1.5	6	0.01	0.04	1.2	3	0
Dairy products[d]	1,437	20.3	20.4	21.1	672	0.6	347	632	517	53	2.6	249	0.16	0.92	0.9	33	5
Fruit and fruit products	524	2.2	0.3	28.2	46	0.9	9	469	50	27	0.4	60	0.14	0.08	0.8	34	65
Vegetables and vegetable products	567	6.5	0.5	25.3	45	2.0	39	1,090	146	50	1.1	602	0.24	0.15	3.1	105	68
Grain products	3,035	21.4	2.6	151.4	41	5.6	170	341	278	79	1.2	1	0.90	[h]0.41	6.4	49	0
Eggs	108	2.3	1.8	0.1	7	0.3	24	21	27	2	0.2	29	0.01	0.07	0.0	9	0
Nuts	278	2.0	6.3	0.7	9	0.3	0	63	43	19	0.3	0	0.06	0.03	0.8	8	0
Oils and fats	1,869	0.1	50.4	0.2	3	0.0	247	7	4	0	0.0	278	0.00	0.01	0.0	0	0
Sugars	1,862	0.0	0.0	115.9	5	0.1	26	10	1	1	0.0	0	0.00	0.00	0.0	0	0
Beverages (alcoholic)[f]	548	0.9	0.0	6.2	13	0.1	28	114	42	20	0.0	0	0.00	0.00	1.2	10	6
Total[g]	**11,661**	**96.6**	**102.4**	**349.1**	**874**	**13.0**	**1,073**	**3,382**	**1,515**	**298**	**11.9**	**2,742**	**1.90**	**2.01**	**22.0**	**275**	**144**

See footnotes at end of table.

(continued)

Table 1 (continued): Estimated supply of nutrients (unadjusted),[a] Australia, 1993–94 to 1997–98 (per capita per day)

		Macronutrients			Trace elements							Vitamins					
Commodity group	Energy	Protein	Fat	Available carbo-hydrate	Calc-ium	Iron	Sodium	Pot-assium	Phos-phorous	Mag-nesium	Zinc	Retinol equiva-lents[b]	Thiamin	Ribo-flavin	Niacin	Total folate	Vitamin C
	kJ	g	g	g	mg	mg	mg	mg	mg	mg	mg	µg	mg	mg	mg	µg	mg
1995–96																	
Meat and meat products	875	25.2	[i]12.1	0.0	10	2.1	77	421	237	26	3.9	1,425	0.33	0.23	5.7	19	1
Poultry	385	8.9	6.4	0.0	3	0.4	29	108	77	9	0.4	19	0.02	0.05	1.7	5	0
Seafood	130	5.4	1.0	0.1	19	0.4	69	84	80	10	1.5	6	0.01	0.04	1.1	3	0
Dairy products[d]	1,482	21.0	21.1	21.4	693	0.6	361	643	532	55	2.6	259	0.17	0.94	0.9	34	5
Fruit and fruit products	528	2.2	0.3	28.5	45	0.9	9	466	50	27	0.4	61	0.14	0.08	0.8	33	64
Vegetables and vegetable products	643	7.3	0.6	28.8	50	2.2	43	1,234	165	56	1.2	629	0.26	0.17	3.5	117	76
Grain products	2,950	22.3	3.2	144.4	47	5.8	126	430	334	121	1.7	1	0.87	[h]0.39	7.7	[c]72	0
Eggs	106	2.3	1.8	0.1	7	0.3	24	20	26	2	0.2	28	0.01	0.07	0.0	9	0
Nuts	266	1.9	6.0	0.6	8	0.3	0	60	41	18	0.3	0	0.06	0.03	0.7	8	0
Oils and fats	1,862	0.1	50.2	0.2	3	0.0	250	6	4	0	0.0	287	0.00	0.01	0.0	0	0
Sugars	2,001	0.0	0.0	124.7	5	0.1	23	11	1	1	0.1	0	0.00	0.00	0.0	0	0
Beverages (alcoholic)[f]	537	0.9	0.0	6.1	13	0.1	28	112	41	20	0.0	0	0.00	0.00	1.1	10	6
Total[g]	**11,763**	**97.4**	**102.7**	**354.8**	**903**	**13.3**	**1,041**	**3,596**	**1,589**	**345**	**12.4**	**2,714**	**1.88**	**2.01**	**23.3**	**309**	**152**

See footnotes at end of table.

(continued)

Table 1 (continued): Estimated supply of nutrients (unadjusted),[a] Australia, 1993–94 to 1997–98 (per capita per day)

		Macronutrients			Trace elements							Vitamins					
Commodity group	Energy	Protein	Fat	Available carbo-hydrate	Calc-ium	Iron	Sodium	Pot-assium	Phos-phorous	Mag-nesium	Zinc	Retinol equiva-lents[b]	Thiamin	Ribo-flavin	Niacin	Total folate	Vitamin C
	KJ	g	g	g	mg	mg	mg	mg	mg	mg	mg	µg	mg	mg	mg	µg	mg
1996–97																	
Meat and meat products	924	26.6	[i]12.8	0.0	10	2.3	82	444	250	28	4.2	1,536	0.33	0.24	6.0	21	1
Poultry	378	8.7	6.2	0.0	3	0.4	29	106	76	9	0.4	19	0.02	0.05	1.7	5	0
Seafood	133	5.5	1.0	0.1	19	0.5	69	87	82	10	1.5	6	0.01	0.04	1.2	3	0
Dairy products[d]	1,493	21.2	21.3	21.4	702	0.6	365	653	539	55	2.7	259	0.17	0.96	0.8	34	4
Fruit and fruit products	514	2.2	0.3	27.6	45	0.9	10	457	49	26	0.4	60	0.13	0.08	0.8	33	64
Vegetables and vegetable products	624	7.1	0.5	27.9	49	2.1	42	1,202	160	55	1.2	627	0.26	0.16	3.5	113	74
Grain products	3,154	23.8	3.4	154.5	50	6.1	118	458	356	129	1.9	1	0.91	[h]0.38	8.1	[c]77	0
Eggs	106	2.3	1.8	0.1	7	0.3	24	20	27	2	0.2	29	0.01	0.07	0.0	9	0
Nuts	281	2.0	6.4	0.7	9	0.3	0	63	44	19	0.3	0	0.06	0.03	0.8	8	0
Oils and fats	1,756	0.1	47.4	0.2	3	0.0	216	6	3	0	0.0	252	0.00	0.01	0.0	0	0
Sugars	2,014	0.0	0.0	125.5	5	0.1	23	11	1	1	0.1	0	0.00	0.00	0.0	0	0
Beverages (alcoholic)[f]	543	0.9	0.0	6.1	13	0.1	28	115	42	20	0.0	0	0.00	0.00	1.2	10	6
Total[g]	**11,919**	**100.5**	**101.1**	**364.1**	**914**	**13.6**	**1,004**	**3,621**	**1,628**	**355**	**12.8**	**2,788**	**1.91**	**2.03**	**24.0**	**312**	**149**

See footnotes at end of table.

(continued)

Table 1 (continued): Estimated supply of nutrients (unadjusted),[a] Australia, 1993–94 to 1997–98 (per capita per day)

		Macronutrients			Trace elements							Vitamins					
Commodity group	Energy	Protein	Fat	Available carbo-hydrate	Calc-ium	Iron	Sodium	Pot-assium	Phos-phorous	Mag-nesium	Zinc	Retinol equiva-lents[b]	Thiamin	Ribo-flavin	Niacin	Total folate	Vitamin C
	kJ	g	g	g	mg	mg	mg	mg	mg	mg	mg	µg	mg	mg	mg	µg	mg
1997–98																	
Meat and meat products	910	26.3	[i]12.5	0.0	10	2.2	81	440	248	28	4.1	1,497	0.34	0.24	5.9	21	1
Poultry	402	9.3	6.6	0.0	4	0.5	31	113	81	10	0.5	20	0.03	0.06	1.8	5	0
Seafood	134	5.6	1.0	0.1	19	0.4	68	88	82	10	1.5	6	0.01	0.04	1.2	3	0
Dairy products[d]	1,467	20.5	21.1	20.9	677	0.7	357	619	519	53	2.6	259	0.17	0.92	0.9	34	5
Fruit and fruit products	533	2.3	0.4	28.6	47	1.0	10	478	51	27	0.5	65	0.14	0.08	0.8	34	67
Vegetables and vegetable products	642	7.2	0.6	28.9	48	2.1	42	1,220	161	55	1.2	613	0.26	0.16	3.5	115	74
Grain products	3,243	24.5	3.5	158.7	51	6.3	132	472	368	133	1.9	1	0.95	[h]0.41	8.4	[c]79	0
Eggs	112	2.4	1.9	0.1	7	0.3	25	22	28	2	0.2	30	0.01	0.08	0.0	9	0
Nuts	273	1.9	6.2	0.6	9	0.3	0	61	42	18	0.3	0	0.06	0.03	0.7	8	0
Oils and fats	1,770	0.1	47.7	0.2	3	0.0	222	6	3	0	0.0	255	0.00	0.01	0.0	0	0
Sugars	2,074	0.0	0.0	129.2	5	0.1	23	9	1	1	0.0	0	0.00	0.00	0.0	0	0
Beverages (alcoholic)[f]	541	0.9	0.0	6.1	13	0.1	28	114	42	20	0.0	0	0.00	0.00	1.1	10	6
Total[g]	**12,100**	**101.0**	**101.6**	**373.4**	**892**	**14.0**	**1,019**	**3,643**	**1,627**	**358**	**12.8**	**2,746**	**1.96**	**2.02**	**24.3**	**317**	**152**

(a) Adjustments have not been made for the loss of nutrients in cooking, or the extra niacin obtained from the metabolism of protein. See Table 2 for adjustments based on specific vitamin availabilities. (b) 'Retinol equivalents' is the sum of retinol content and one-sixth of the carotene equivalent. (c) The increase in folate values from 1995–96 onwards may be attributable to the use of revised nutrient composition data from 1995–96 onwards reflecting fortification of some grain products. (d) 'Dairy products' excludes butter, which is included in 'Oils and fats'. (e) The ABS was not able to supply data on 'Grain products' available for consumption in 1993–94. Consequently, nutrient values have been derived from 'Grain products' available for consumption in 1994–95. (f) 'Alcoholic beverages' comprises beer, wine and spirits, the energy value of which includes the contribution made by alcohol. (g) Where data have been rounded, discrepancies may occur between sums of the component items and totals. (h) The decline in riboflavin values in grain products compared with previously published data may be attributable to the use of revised nutrient composition data for flour.
(i) The decline in fat values in meat and meat products compared with previously published data may be attributable to the use of revised nutrient composition data for beef, lamb and pigmeat.

Table 2: Adjustments to the availability of specific vitamins,[a] Australia, 1993–94 to 1997–98 (mg per capita per day)

	1993–94		1994–95		1995–96		1996–97		1997–98	
	Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**
Vitamin C										
Dairy products										
Fluid whole milk	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8	2.8
Other milk products	1.6	1.6	1.7	1.7	1.7	1.7	1.5	1.5	1.9	1.9
Meat and meat products	r0.6	(b)	0.6	(b)	0.6	(b)	0.7	(b)	0.7	(b)
Fish	r0.2	(b)	0.2	(b)	0.2	(b)	0.2	(b)	0.2	(b)
Beverages, alcoholic	6.1	6.1	6.1	6.1	6.0	6.0	6.0	6.0	6.0	6.0
Fruit and fruit products										
Fresh, canned and dried	r18.9	r16.5	18.0	15.7	18.3	16.1	17.9	15.7	19.0	17.0
Cooked	r0.5	r0.3	0.5	0.3	0.6	0.3	0.6	0.3	0.5	0.3
Citrus	44.1	44.1	46.2	46.2	45.4	45.4	45.3	45.3	47.4	47.4
Vegetables and vegetable products										
Fresh tomatoes	r3.3	r3.3	4.1	4.1	5.3	5.3	7.3	7.3	6.4	6.4
Lettuce	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7
Canned vegetables	r21.6	r9.5	18.8	8.3	19.4	8.8	18.1	8.3	17.1	8.3
Cooked potatoes and other vegetables	r47.0	r23.5	44.3	22.2	50.8	25.4	48.1	24.0	49.2	24.6
Total vitamin C[c]	*r147.3*	*r108.2*	*143.9*	*107.8*	*151.7*	*112.4*	*149.1*	*111.9*	*151.9*	*115.4*
Thiamin	r1.93	r1.64	1.90	1.62	1.88	1.59	1.91	1.62	1.96	1.67
Niacin equivalents[d]	r22.5	r38.8	22.0	38.2	23.3	39.6	24.0	40.8	24.3	41.2

(a) Losses in cooking have been estimated for vitamin C and thiamin only; losses of other nutrients are not likely to be significant.
(b) Little vitamin C would be retained in these foods.
(c) Where the data have been rounded, discrepancies may occur between sums of the component items and totals.
(d) The niacin equivalent of a diet is computed from dietary niacin plus 0.16 times the dietary protein in grams, expressed in milligrams.

Table 3: Estimated nutrients available for consumption (adjusted),[a] Australia, 1993–94 to 1997–98 (per capita per day)

Nutrient	Unit	1993–94	1994–95	1995–96	1996–97	1997–98
Energy	kJ	r11,898	11,661	11,763	11,919	12,100
Macronutrients						
Protein—						
Animal	g	r64.1	63.3	62.7	64.4	64.1
Vegetable	g	r33.7	33.2	34.7	36.2	36.9
Total[b]	g	r97.9	96.6	97.4	100.5	101.0
Fat (from all sources)	g	r103.7	102.4	102.7	101.1	101.6
Available carbohydrate	g	r358.7	349.1	354.8	364.1	373.4
Trace elements						
Calcium	mg	r871	874	903	914	892
Iron	mg	r13.3	13.0	13.3	13.6	14.0
Sodium	mg	1,095	1,073	1,041	1,004	1,019
Potassium	mg	3,467	3,382	3,596	3,621	3,643
Phosphorous	mg	1,532	1,515	1,589	1,628	1,627
Magnesium	mg	302	298	345	355	358
Zinc	mg	12.0	11.9	12.4	12.8	12.8
Vitamins						
Retinol equivalents	µg	r2,720	2,742	2,714	2,788	2,746
Thiamin	mg	r1.64	1.62	1.59	1.62	1.67
Riboflavin	mg	r2.04	2.01	2.01	2.03	2.02
Niacin equivalents	mg	r38.8	38.2	39.6	40.8	41.2
Total folate[c]	µg	280	275	309	312	317
Vitamin C	mg	r108	108	112	112	115

(a) Adjustments have been made for the loss of nutrients in cooking and the extra niacin obtained from the metabolism of protein.
(b) Where the data have been rounded, discrepancies may occur between sums of the component items and totals.
(c) The increase in folate values may be attributable to the use of revised nutrient composition data from 1995–96 onwards reflecting fortification of some grain products.

Table 4: Percentage of energy derived from each commodity group, Australia, 1993–94 to 1997–98

Commodity group	1993–94	1994–95	1995–96	1996–97	1997–98
Meat and meat products	r8.1	8.0	7.4	7.8	7.5
Poultry	r3.2	3.2	3.3	3.2	3.3
Seafood	1.1	1.2	1.1	1.1	1.1
Dairy products	r11.9	12.3	12.6	12.5	12.1
Fruit and fruit products	r4.6	4.5	4.5	4.3	4.4
Vegetables and vegetable products	r5.0	4.9	5.5	5.2	5.3
Grain products	r25.8	26.0	25.1	26.5	26.8
Eggs	0.9	0.9	0.9	0.9	0.9
Nuts	r2.1	2.4	2.3	2.4	2.3
Oils and fats	r16.1	16.0	15.8	14.7	14.6
Sugars	r16.4	16.0	17.0	16.9	17.1
Beverages (alcoholic)	4.7	4.7	4.6	4.6	4.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 5: Nutrients available for consumption (adjusted)[a] compared with Recommended Dietary Intakes (RDIs), Australia, 1993–94 to 1997–98

			Trace elements							Vitamins					
	Energy	Protein[b]	Calcium	Iron[b]	Sodium[b]	Pot-assium[b]	Phos-phorous	Mag-nesium	Zinc[b]	Retinol equiva-lents	Thiamin	Riboflavin	Niacin equivalents	Total folate[c]	Vitamin C
	kJ	g	mg	mg	mg	mg	mg	mg	mg	µg	mg	mg	mg	µg	mg
RDI	**r9,305**	**r46.1**	**r840**	**9.2**	**1,520**	**3,535**	**958**	**263**	**11.1**	**r688**	**0.89**	**1.36**	**15.2**	**186**	**34**
1993–94															
Available nutrients	r11,898	r97.9	r871	r13.3	1,095	3,467	1,532	302	12.0	r2,720	r1.64	r2.04	r38.8	280	r108
% in excess of RDI	r28	r112	r4	r45	–28	–2	60	15	8	r295	r83	r50	r155	51	r215
1994–95															
Available nutrients	11,661	96.6	874	13.0	1,073	3,382	1,515	298	11.9	2,742	1.62	2.01	38.2	275	108
% in excess of RDI	25	109	4	42	–29	–4	58	14	8	298	81	47	151	48	215
1995–96															
Available nutrients	11,763	97.4	903	13.3	1,041	3,596	1,589	345	12.4	2,714	1.59	2.01	39.6	309	112
% in excess of RDI	26	111	7	45	–32	2	66	31	12	294	78	48	160	67	228
1996–97															
Available nutrients	11,919	100.5	914	13.6	1,004	3,621	1,628	355	12.8	2,788	1.62	2.03	40.8	312	112
% in excess of RDI	28	118	9	48	–34	2	70	35	16	305	81	48	168	68	227
1997–98															
Available nutrients	12,100	101.0	892	14.0	1,019	3,643	1,627	358	12.8	2,746	1.67	2.02	41.2	317	115
% in excess of RDI	30	119	6	52	–33	3	70	36	16	299	87	48	170	71	237

(a) Adjustments have been made for the loss of nutrients in cooking and the extra niacin obtained from the metabolism of protein.
(b) RDIs for protein, iron, sodium, potassium and zinc are calculated on the mid value for the RDI range for each sex and age group.
(c) The increase in folate values may be attributable to the use of revised nutrient composition data from 1995–96 onwards reflecting fortification of some grain products.

Explanatory notes

Methodology

Basis of nutrient calculations

Foodstuffs data are collected by the ABS annually and are derived from a variety of sources, including ABS statistical collections, industry associations and government regulatory authorities. Nutrient data are supplied by FSANZ and are derived from the NUTTAB95 and AUSNUT databases. Linking the ABS data with the FSANZ data produces the apparent nutrient consumption data presented in this report.

Foodstuffs data

The food consumption data used here are derived from the *Apparent Consumption of Foodstuffs* series compiled by the ABS. In general, the scope includes all foodstuffs available for consumption by the Australian population, including fats and oils, some beverages and sugars (ABS 2000). Apparent consumption of the various foodstuffs is estimated from the following equation:

Apparent consumption =

Commercial production

+ Estimated home production

+ Imports

+ Opening stocks

MINUS

Exports

+ Usage for processed foods

+ Non-food use

+ Wastage

+ Closing stocks

Where appropriate, apparent consumption data are expressed as per capita per day as this is the most useful method for monitoring purposes. Per capita apparent consumption is total apparent consumption divided by the mean population for the period divided by the number of days in the year. Because the calculated values are averages of per capita availability of the food supply for the population as a whole, they give no information on the food consumption of individuals or groups of individuals within the population. Also, the data are for 'food available for consumption' which is not the same as food consumed. The Food and Agriculture Organization has estimated that where there is a plentiful food supply, up to 15 per cent of food available may be wasted.

For further explanatory notes about the apparent consumption data collated by the ABS, refer to the *Apparent Consumption of Foodstuffs 1997–98 and 1998–99* (ABS 2000).

The apparent consumption of foodstuffs series was recently reviewed (see 'ABS review of the Apparent Consumption series' below) and several amendments to the data were made. The following is a brief description of modifications to the foodstuffs data supplied to the AIHW from the ABS that should be noted when interpreting the apparent consumption of nutrients tables:

- **Meat and meat products:** Data supplied for meat are 'carcass weight equivalent', based on dress carcass weight as reported by the abattoir ('bone in') (ABS 2000). 'Offal and meat not elsewhere included' are not included in the nutrient calculations, due to concerns about the accuracy of the data.
- **Seafood:** Data supplied are only for 'total fish' and 'total crustaceans and molluscs' due to unacceptable data quality for 'seafood otherwise prepared'. This may partially explain the calcium values for 'Seafood', which are lower than previously published.
- **Dairy products:** Apparent consumption of yoghurt and ice cream is not included in the data collection so nutrient intake for dairy products will be underestimated. The quantity of cream available for consumption is based on an ABS estimate. Apparent consumption data for 'Condensed, concentrated and evaporated milk' have been significantly revised for the years 1993–94 onwards and data previously published as 'Infants' and 'Invalids food' are not included due to concerns about data quality (ABS 2000). Both full cream and skim milk have a break in series between the previous years and 1997–98 due to improvements implemented as a result of the review.
- **Fruit and fruit products:** Apparent consumption data for processed pears are not included due to concern about data quality.
- **Vegetables and vegetable products:** During the period covered by the data, the only items for which accurate processing data were provided are peas, pickled onions, cucumbers, gherkins, mushrooms, olives and other vegetables (frozen, pickled and otherwise prepared). There was a large drop in the volume of tomatoes available for consumption as a result of a large change in stock data of processed tomatoes during 1997–98. Apparent consumption data for processed cabbages are not included due to concern about data quality.
- **Grain products:** A review of the 'wheaten flour' data published previously has resulted in a revised collection method. As a result, the ABS were not able to supply data for 1993–94. To account for the missing data, nutrient values have been derived from 'wheaten flour' available for consumption in 1994–95. For the years 1994–95 onwards, 'wheaten flour' excludes flour used for the manufacture of starch and gluten (ABS 2000). For 'wheaten flour' and 'rolled oats' there is a break in series between previous years and 1997–98 data, due to improvement in collection methods and coverage as a result of the review. No data are collected on the quantities available for consumption of any flour other than wheat.
- **Oils and fats:** An annual per capita allowance of 10 kg is included to represent the additional edible oils consumed as part of cooking, although this is considered to be conservative (ABS 2000).
- **Beverages:** Herbal tea data are not collected.

Nutrient data

Two sources of nutrient data were used. The primary source was the NUTrient Data TABle for Use in Australia (NUTTAB95) database. NUTTAB95 is a nutrient composition database

of 1,800 foods, compiled mainly from information originally published in the *Composition of Foods, Australia* (COFA) series.

Where appropriate NUTTAB95 data were unavailable, data were extracted from the AUSNUT—Australian Food and Nutrient Database (ANZFA 1999), a separate and newer database of over 4,500 foods, which was compiled from the technical support files used to code the food consumption records in the 1995 ABS National Nutrition Survey (NNS).

In addition, revised nutrient data were extracted from AUSNUT for breakfast foods and flour, reflecting fortification practices, for beef, lamb and mutton and pigmeat, to better represent apparent changes in the nutrient composition of meat in recent times, and for table margarine, to incorporate the introduction of reduced fat varieties.

Foodstuffs data collected by the ABS and nutrient data supplied by FSANZ are not classified the same for all foods. Consequently, linking the two data sources required making some assumptions and approximations. For example, a substantial number of the nutrient consumption data lines had to be derived using a composite of two or more foods from the NUTTAB95 or AUSNUT nutrient databases. Where weightings were applied, these were derived from several sources, mainly 1995 NNS consumption data and other ABS data. Composite lines derived using 1995 NNS consumption data could therefore only validly be applied from 1995 onwards.

Apparent consumption of nutrients was last published by the ABS in *Apparent Consumption of Foodstuffs and Nutrients, Australia 1993–94* (ABS 1997).

Estimation of nutrients, unadjusted

Details of nutrients available for consumption (unadjusted) in 1993–94 to 1997–98 are given in Table 1. Unadjusted values take into account wastage due to inedible components of fresh foods, such as skin, seeds and bones, but not wastage which may occur after production and prior to purchase. Except for fruit reported as dried fruit, the unadjusted values do not take into account losses of nutrients which occur during processing and cooking (ABS 1997).

Estimation of nutrients, adjusted

The availability of specific vitamins, and estimations of nutrients available for consumption, (adjusted), are presented in Tables 2 and 3. Preserving, processing, storing and cooking of food may cause some vitamins to be lost before the food is consumed. In this report, adjustments have been made for vitamin C and thiamin losses, and for additional niacin derived from dietary protein intake. Other vitamins undergo minimal loss so no adjustments are incorporated into the nutrient calculations, as they are unlikely to be nutritionally significant.

Vitamin C

There is negligible vitamin C in foods from the 'Poultry', 'Fish and seafood', 'Eggs', 'Grain products', 'Nuts', 'Sugars' and 'Fats and oils' commodity groups. The amount of vitamin C in foods from the meat commodity group is only 2 mg per capita per day and it is assumed to be destroyed by cooking. There are small contributions of vitamin C from dairy products and alcoholic beverages, and it is assumed that these are preserved.

Fruit and vegetables contribute more than 90% of the vitamin C supply; losses of vitamin C from foods within these groups are variable. Adjustments are made for the effect of

processing (except juicing) on the vitamin C content of the fruit commodity group, and for processing and cooking on the vitamin C content of the vegetables commodity group.

Thiamin

The loss of thiamin from food processing or cooking is variable and depends on both the method and duration of cooking. The estimated average loss is taken to be 15%.

Niacin equivalent

On average, 16.7% of the amino acid tryptophan in dietary protein is converted to niacin in the body. Since the average tryptophan content of protein is 1%, the niacin equivalent of protein averages 0.167%, per capita per day.

Conversion factors

The ABS reports food data as kilograms (kg) per capita per year. FSANZ reports nutrient data per 100 gram (g) of the edible portion. This report presents nutrient data as per capita per day and in gram (g), milligram (mg) or microgram (µg) units where appropriate. Therefore, it is necessary for the nutrient data to undergo some simple arithmetic manipulation so that it can be expressed in the required form.

Comparison with Recommended Dietary Intakes

Recommended Dietary Intakes (RDIs) are reference levels of nutrients (expressed as amount per capita per day) likely to provide adequately for the needs of the population as a whole.

Nutrients available for consumption in the Australian food supply compared with RDIs are presented in Table 5. A population weighted RDI is calculated for each nutrient using ABS data on the age and sex composition of the population for the same year, and RDIs for age and sex provided by the National Health and Medical Research Council. This allows for assessment of the adequacy of the food supply in relation to the needs of the population.

It should be noted that RDIs are designed to exceed the actual nutrient requirements of practically all healthy persons and are not synonymous with requirements (NHMRC 1991). They are used appropriately as an indicator of the nutritional adequacy of the food supply, that is, if nutrient estimates exceed the RDIs, then it is known that the population as a whole has available to it an adequate supply of nutrients. The converse is not true, however, and if the supply of the nutrient was below the RDI, it would indicate a need for further investigation of nutrient intake rather than nutrient supply.

ABS review of the Apparent Consumption series

A review of the *Apparent Consumption of Foodstuffs* series was undertaken in mid-2000 by the ABS. It was the finding of the review that methods used for collecting and interpreting data that form the basis of the Apparent Consumption series were becoming outdated and inexact, especially given the availability of more precise methods of data collection such as those using shop scanning techniques. Substantial resources would be required to improve the apparent consumption series data quality.

Despite these findings, the data presented in this report still serve a valuable purpose, particularly in regard to providing an indication of time trends in the nutrient supply and available energy. Cross-sectional surveys such as the 1995 National Nutrition Survey, while providing a wealth of useful information, are unable to provide such trend data, unless conducted on a regular basis. Given their expense, this is presently not a feasible option.

As such, the *Apparent Consumption* series both for foodstuffs (ABS 2000) and nutrients continue to provide a valuable nutrition resource and are used by all levels of government to help inform food policy formation.

More information

For a more in-depth understanding of the sources and structure of the Apparent Consumption database and how it is used to generate the nutrient data, refer to Apparent consumption of nutrients: sources and structure of the database (Lester and Coles-Rutishauser 1996). More recent information about revisions to the nutrient composition data can also be obtained from FSANZ.

References

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